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ABSTRACT

Elected officials have a special obligation to monitor and make informed decisions about computer expenditures. In doing so, officials should insist that a needs assessment be carried out; review all cost and configuration data; draw up a master plan specifying user needs as well as hardware, software, and personnel requirements; and subject various methods of providing computer services to cost-benefit analyses. Five alternatives for meeting computing requirements are: (1) contracting with a computer services bureau which, while costly and less flexible for users, can free the agency from hardware and software maintenance; (2) joining with other users in operating a shared computer center, which can reduce hardware development costs; (3) maintaining a full in-house hardware and software operation, which often best suits large institutions; (4) purchasing software while maintaining an internal hardware operation; and (5) entering a full or partial facilities management agreement with a vendor which manages all, or a portion of, an institution's computer operations. This last alternative has been implemented successfully by the San Diego Community College District. Two final suggestions for the concerned official are to attempt to assess computing costs in terms of output, rather than in terms of dollar amounts; and to assure that cost savings are actually realized through the mechanization of jobs formerly performed by employees. (JP)

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HOW ELECTED OFFICIALS CAN CONTROL COMPUTER COSTS

BY

DAN GRADY, PRESIDENT, BOARD OF TRUSTEES
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ALL OF US CONNECTED WITH PUBLIC INSTITUTIONS ARE EXPERIENCING A TIME OF FISCAL STRINGENCY. ELECTED OFFICIALS RESPONDING TO THE SPIRIT OF THE TIMES AND TO FISCAL RESPONSIBILITY ARE GUARDING THE EXPENDITURES OF TAX DOLLARS EVER MORE CAREFULLY.

EXPENDITURES IN THE COMPUTER AREA STAND OUT PROMINENTLY IN MOST GOVERNMENT AGENCY BUDGETS. THE NEED FOR NEW OR ADDED HARDWARE, SOFTWARE, AND PERSONNEL IS OFTEN NOT UNDERSTOOD.

COMPUTER JARGON AND TECHNOLOGY ARE DIFFICULT, IF NOT IMPOSSIBLE, FOR THE UNINITIATED TO UNDERSTAND. HARDWARE AND SOFTWARE CHANGES RESULTING FROM NEW TECHNOLOGY CONFUSE THE LAYMAN AND OFTEN RESULT IN RAISING QUESTIONS ABOUT COMPUTER STAFF COMPETENCE.

HOW DO PUBLIC OFFICIALS MAKE DECISIONS ABOUT MULTIMILLION DOLLAR COMPUTER OPERATIONS? THERE IS NO QUICK-MIX METHOD FOR BECOMING COMPUTER LITERATE. THERE ARE, HOWEVER, PROCESSES THAT MIGHT HELP DECISION-MAKERS HEAD IN THE RIGHT DIRECTION.

FIRST, A NEEDS ASSESSMENT. ALL POTENTIAL USES SHOULD BE SUBJECTED TO A PRELIMINARY COST/BENEFIT ANALYSIS. MANDATORY ITEMS SHOULD BE DISTINGUISHED FROM THOSE WHICH ARE DISCRETIONARY. NEEDS OF MANAGEMENT, STUDENTS, AND FACULTY SHOULD ALL BE CAREFULLY ANALYZED.

NEXT, DATA REGARDING THE SIZE, CONFIGURATION, AND COST OF HARDWARE REQUIRED TO MEET TENTATIVE USES SHOULD BE REVIEWED.

THIRDLY, A THREE- TO FIVE-YEAR MASTER PLAN SPECIFYING USER NEEDS, HARDWARE, SOFTWARE, AND PERSONNEL IS ESSENTIAL. AGAIN, EACH ITEM SHOULD BE SUBJECTED TO A COST/BENEFIT ANALYSIS. DECISIONS SHOULD BE REACHED IN THE PLANNING PROCESS THAT DEFINE THE SCOPE OF COMPUTER ACTIVITY AND SYSTEMS FOR FUTURE DECISION MAKING.

FINALLY, ALTERNATIVE WAYS OF PROVIDING THE COMPUTER SERVICE SHOULD BE EXAMINED AND SUBJECTED TO A COST/BENEFIT ANALYSIS.

FOR THE CONVENIENCE OF MY PAPER TODAY, I WILL BRIEFLY REVIEW SIX ALTERNATIVE APPROACHES WHICH ARE WORTH CONSIDERATION.

ESTABLISH A RELATIONSHIP WITH A SERVICE BUREAU

THE ADVANTAGES OF THIS APPROACH ARE: 1) THAT YOU PAY A FIXED PRICE FOR A SPECIFIED SERVICE WHICH MAY BE EITHER NEGOTIATED OR BID; 2) AN OUTSIDE AGENCY IS RESPONSIBLE FOR THE TECHNICAL ASPECTS OF HARDWARE AND HARDWARE OPERATION; 3) SOFTWARE MAINTENANCE AND DEVELOPMENT PERSONNEL CAN BE EMPLOYED BY THE SERVICE BUREAU, BY THE INSTITUTION, OR BY OTHER ARRANGEMENTS. DISADVANTAGES INCLUDE: 1) IT IS DIFFICULT TO WRITE NEEDED CONTROLS INTO A CONTRACT; 2) LESS FLEXIBILITY FOR USERS; 3) SOMETIMES COSTS ARE HIGHER; 4) EQUITY IN HARDWARE DOES NOT ACCRUE. THE SERVICE BUREAU APPROACH MAY BEST FIT SMALL INSTITUTIONS AND DEDICATED FUNCTIONS IN LARGE INSTITUTIONS.

JOIN OTHER USERS IN OPERATING A COMPUTER CENTER

FORM AN ORGANIZATION WITH OTHERS OF LIKE INTEREST TO OPERATE A COMPUTING CENTER. THIS ALTERNATIVE HAS MANY OF THE SAME DISADVANTAGES AS THOSE WE JUST REVIEWED WITH A FEW ADDITIONAL ADVANTAGES. THE JOINT ENTERPRISE COULD BE OPERATED BY A BOARD WHICH WOULD GIVE USERS

A STRONGER VOICE. AN ADDITIONAL ADVANTAGE COULD BE A SHARP REDUCTION IN SOFTWARE DEVELOPMENT OR PURCHASE COSTS. THIS ALTERNATIVE MIGHT BEST SUIT A LARGE INSTITUTION OPERATING TOGETHER WITH A NUMBER OF SMALL INSTITUTIONS WITHIN A GEOGRAPHICAL AREA.

FULL INHOUSE PERSONNEL FOR HARDWARE OPERATION AND SOFTWARE DEVELOPMENT AND MAINTENANCE

HARDWARE IS EXPENSIVE. PURCHASE MUST BE JUSTIFIED ON THE BASIS OF USE OVER TIME. THE INHOUSE DEVELOPMENT OF SOPHISTICATED SOFTWARE MAY BE THE LARGEST COMPUTER-RELATED WASTE OCCURRING TODAY. A LARGE ADMINISTRATIVE SYSTEM, SUCH AS PERSONNEL/PAYROLL, STUDENT INFORMATION, AND FINANCE CAN BE PURCHASED AT A FRACTION OF THE DEVELOPMENTAL COST. WITH FEW EXCEPTIONS, SOFTWARE DEVELOPMENT, OUTSIDE OF RESEARCH, MAKES POOR ECONOMIC SENSE.

AN INSTITUTION HAS MORE OR LESS FULL CONTROL OF ITS OWN STAFF. THAT SHOULD BE AN ADVANTAGE; BUT TENURE, LIKE LAWS, OFTEN MAKE STAFF SHIFTS AND CHANGES DIFFICULT. IN ADDITION, INSTITUTIONAL MANAGERS FREQUENTLY LACK THE KNOWLEDGE AND SKILL TO CHOOSE BETWEEN COMPETENT AND LESS DESIRABLE TECHNICAL PERSONNEL.

PURCHASE SOFTWARE WHILE HAVING AN INTERNAL HARDWARE OPERATION AND A SOFTWARE MAINTENANCE STAFF

THERE IS AN IMPORTANT ADVANTAGE TO HAVING A CLOSE RELATIONSHIP BETWEEN A COMPUTING STAFF AND USERS. SUCH A RELATIONSHIP IS POSSIBLE UNDER ANY OF THE ALTERNATIVES HERE REVIEWED BUT MAY BE ENHANCED MORE BY SOME RATHER THAN OTHERS. CAREFUL DEVELOPMENT OF NEEDED SOFTWARE REQUIREMENTS CAN RESULT IN NUMEROUS VENDOR POSSIBILITIES WHICH, WITH LITTLE CUSTOMIZING, CAN RESULT IN A VERY USABLE PRODUCT AT A SHARPLY REDUCED COST. EVERYONE DOES NOT NEED TO INVENT THE SAME WHEEL.

IF YOUR CURRENT COMPUTER STAFF IS HIGHLY COMPETENT, THIS MAY BE THE BEST CHOICE FOR YOU.

ENTERING A FULL OR PARTIAL FACILITIES MANAGEMENT AGREEMENT

FACILITIES MANAGEMENT (FM), SIMPLY DEFINED, MEANS THAT THE INSTITUTION HIRES A VENDOR TO MANAGE ALL, OR A PORTION OF, THEIR COMPUTER OPERATION. PARTIAL FACILITIES MANAGEMENT, OFTEN REFERRED TO AS SHADOW MANAGEMENT, MEANS THAT A COMPANY IN THE COMPUTER MANAGEMENT BUSINESS WOULD BRING IN TOP-LEVEL COMPUTER PERSONNEL TO MANAGE YOUR COMPUTER STAFF. FULL FACILITIES MANAGEMENT WOULD MEAN THAT A VENDOR WOULD EMPLOY ALL OF THE COMPUTER STAFF AND MAY OR MAY NOT FURNISH THE HARDWARE AS WELL. THE SAN DIEGO COMMUNITY COLLEGE DISTRICT, WHERE I AM A TRUSTEE, HAS A FACILITIES MANAGEMENT CONTRACT WITH THE SYSTEMS AND COMPUTER TECHNOLOGY CORPORATION (S.C.T.). OUR RELATIONSHIP IS WORKING WELL FOR US SO I MAY SPEAK HERE WITH A MODEST BIAS.

EIGHTEEN MONTHS AGO, OUR COMPUTER OPERATION WAS A NEAR DISASTER. COSTS WERE RISING, DEMAND FOR NEW EQUIPMENT WAS RISING, BUT NEITHER AS FAST AS THE COMPLAINTS FROM FACULTY, STUDENTS, AND MANAGERS ABOUT THE INADEQUACY OF THE COMPUTER SHOP. STAFF RECOMMENDATIONS REGARDING PROPOSED SOLUTIONS AT ONE TIME OR ANOTHER INCLUDED ALL OF THE ABOVE ALTERNATIVES IN ADDITION TO SUGGESTING THE EMPLOYMENT OF NEW MANAGEMENT STAFF. NONE OF THE RECOMMENDATIONS SATISFIED THE BOARD OF TRUSTEES' INSISTENT QUESTIONS REGARDING COST CONTAINMENT, SYSTEMS DELIVERY TIMETABLES, COST/BENEFIT ANALYSIS, STAFF EXPANSION, AND NEW SYSTEMS IMPLEMENTATION. OUR DISTRICT TURNED TO FACILITIES MANAGEMENT BECAUSE IT PROVIDED US WITH PROVEN COMPUTER SYSTEM MANAGEMENT SKILLS,

SHORT-TERM HUMAN/TECHNICAL RESOURCES OF A LARGE CORPORATION, A TRACK RECORD OF STRONG USER LIAISON, A FIXED DOLLAR COST, AND THE SKILL AND ABILITY TO BRING UP COMPLEX, INTERACTIVE, REAL-TIME PROGRAMS IN A SHORT PERIOD. IN OUR EIGHTEEN-MONTH EXPERIENCE, WE HAVE PUT UP A NEW TRANSACTIONAL PAYROLL/PERSONNEL SYSTEM; WE HAVE REGISTERED A MAJORITY OF OUR 94,000 STUDENTS AS A PART OF A COMPREHENSIVE STUDENT SYSTEM; WE HAVE INSTALLED A NEW FINANCIAL ACCOUNTING SYSTEM, AND AT THE SAME TIME, WE HAVE DOUBLED OUR ENROLLMENT IN COMPUTER SCIENCE INSTRUCTION AND MADE SIGNIFICANT INCREASES IN COMPUTER ASSISTED AND MANAGED INSTRUCTION, AS WELL AS FACULTY USE OF THE COMPUTER FOR A VARIETY OF PURPOSES. WE HAVE INCREASED OUR ROUTINE PRODUCTION BY 61% WITH THE SAME NUMBER OF STAFF PERSONNEL WHILE WE INSTALLED THREE MAJOR NEW SYSTEMS. OBVIOUSLY, I AM PLEASED WITH OUR SUCCESS. BUT THERE ARE NEGATIVE ASPECTS OF FACILITIES MANAGEMENT. THE COMPUTER OPERATION DOES COST MORE THAN IT DID BEFORE, IF YOU MEASURE ONLY BY DOLLARS APPROPRIATED. THE STAFF WORKS FOR S.C.I.; NOT FOR OUR COLLEGE. IF WE WERE TO DECIDE TO GO BACK TO AN INTERNAL OPERATION, THE SHIFT COULD PRESENT DIFFICULTIES.

FINALLY, WE FIND OURSELVES THE VICTIMS, OR THE BENEFACTOR, OF NUMEROUS VISITORS COMING, NOT ONLY FROM THE UNITED STATES, BUT ELSEWHERE IN THE WORLD TO SEE HOW WE TURNED A LOSER INTO A WINNER. ON BALANCE, WE IN SAN DIEGO THINK WE HAVE A REAL COMPUTER BARGAIN.

ANY OF THE ABOVE ITEMS COULD BE DEALT WITH IN A VARIETY OF COMBINATIONS. ELECTED OFFICIALS CAN GET SECOND OPINIONS FROM CONSULTANTS, COMPETING VENDORS, OR OTHER INSTITUTIONS.

MANY ELECTED OFFICIALS ATTEMPT TO CONTROL COSTS BY LIMITING DOLLAR EXPENDITURES. IN THE COMPUTER FIELD, THIS MAY BE A BIG MISTAKE. IT IS FAR MORE IMPORTANT TO CONTROL THE COST PER UNIT OF OUTPUT. THE NEXT LOGICAL POINT OF CONTROL THEN BECOMES MAKING DELIBERATE DECISIONS ABOUT INPUT AND OUTPUT. SIMPLY REDUCING DOLLAR COSTS CAN RESULT IN MAKING A DISASTER OUT OF YOUR ENTIRE COMPUTER OPERATION. CONTROLLING OUTPUT COSTS MAKES POSSIBLE MAINTAINING THE QUALITY OF OPERATION WHILE REDUCING THE QUANTITY.

THE KEY FACTORS FOR AN ELECTED OFFICIAL TO KNOW ARE: WHAT OPTIONS EXIST; TO DETERMINE INSTITUTIONAL NEEDS; TO INSIST ON RELIABLE COST/BENEFIT DATA AND TO CONTROL COST PER OUTPUT SERVICE PROVIDED, NOT JUST TOTAL DOLLAR EXPENDITURE.

WHEN SYSTEMS ARE COMPUTERIZED, IT USUALLY MEANS THAT TEDIOUS WORK FORMERLY DONE BY EMPLOYEES IS DONE BY A MACHINE. FREQUENTLY, THE NUMBER OF EMPLOYEES REMAINS THE SAME OR INCREASES WHEN WORK FUNCTIONS ARE SHIFTED. SUCH SHOULD NOT BE THE CASE. COST SAVINGS CAN AND SHOULD BE REALIZED WHEN WORK FUNCTIONS ARE COMPUTERIZED. A STUDY OF WORK TASKS IN ANY SYSTEM BEFORE AND AFTER COMPUTERIZATION, WHEN COMPARED, WILL SHOW WHERE SAVINGS CAN BE MADE.

IN OUR SYSTEM ALONE, A RECENT STUDY SHOWS THE POTENTIAL OF SAVING $330,000 ANNUALLY IN PERSONNEL COSTS BY THE COMPUTER DOING WORK FORMERLY DONE BY EMPLOYEES. TO REALIZE SUCH SAVINGS, CAREFUL ADMINISTRATIVE FOLLOW-THROUGH WILL BE REQUIRED.

ALERT ELECTED OFFICIALS WILL INSIST ON SUCH REPORTS AND MONITOR THE IMPLEMENTATION OF SUCH SAVINGS.

ELECTED OFFICIALS NEED NOT BE COMPUTER EXPERTS, BUT BY PERSISTENT RAISING OF QUESTIONS AND A MODEST KNOWLEDGE OF ALTERNATIVES, THEY CAN, AND SHOULD, PLAY THE MOST IMPORTANT ROLE IN DECISION-MAKING ABOUT COMPUTERS.

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